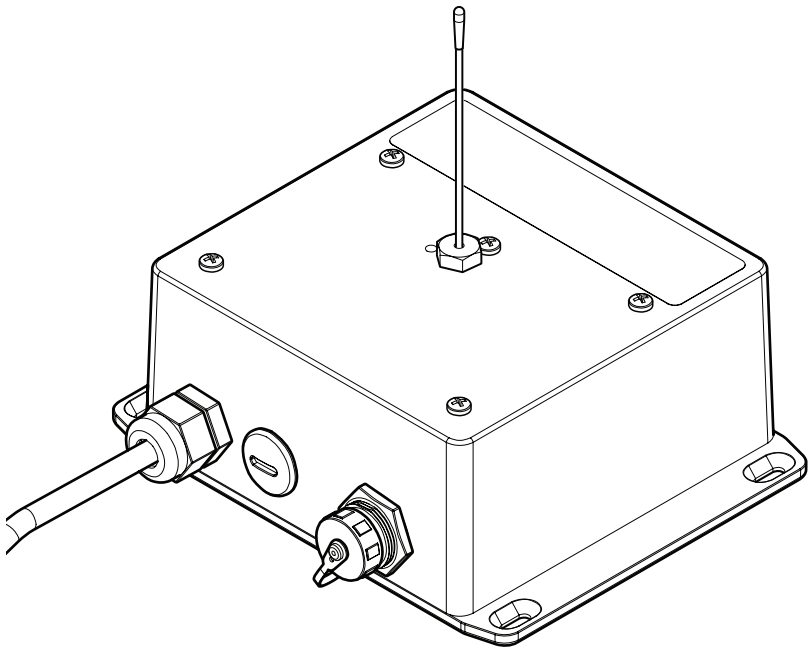
Load Systems International

Manufacturers of Wireless
Weighing Systems

LSI Wireless Gateway System

(Applies to: LSI Gateway series GS220 to GS224 and GS series sensors)

INSTALLER AND USER'S MANUAL



WARNING! **The LSI Wireless Gateway system is designed to aid in the collection of information and is in no way a substitute for safe operating practice.**

WARNING! **Carefully read and understand this manual before proceeding.**

BEFORE PROCEEDING

Read and understand the following:

For your safety and that of the people that come into contact with ***LSI*** products, understand the significance of the instructions included in this guide, respect all laws and regulations and comply with applicable standards.

Pay particular attention to items bearing the alert symbol ⚠ and the following words:

WARNING!

Warning: this denotes an instruction that if not complied with may lead to serious injury or death.

CAUTION!

Caution: this denotes an instruction that if not complied with may lead to product failure or property damage.

IMPORTANT!

Important: this denotes an instruction that if not complied with may lead to product performance issues.

WARNING! **The system must be installed in compliance with *LSI* instructions and using *LSI* supplied components only. Failure to install all parts, or replacing parts or components with parts or components not supplied by *LSI*, may lead to system failure, serious injury or death.**

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1. INTRODUCTION

1.1 Overview

The ***LSI Wireless Gateway*** system consists of one or more ***LSI Wireless Gateway*** and one or more ***LSI*** GS series sensors. The ***LSI Gateway*** is a generic receiver/transmitter that transfers information received from the sensors to an external user interface or control unit. The ***LSI Gateway*** is compatible with ***LSI*** GS series sensors. There are many variations and possible configurations of the ***LSI Gateway*** designed to integrate with a wide variety of applications.

External communication with the ***LSI Gateway*** can be handled through a number of different optional communication ports including RS232, USB, CAN-bus, J1939, and voltage outputs. The ***LSI Gateway*** allows information to be exchanged in both directions between the ***LSI*** wireless network and the communication port.

The ***LSI Gateway*** has two operating modes: network controller and listen only. Understanding the two operating modes is important to successful set-up of the wireless network.

⚠ *WARNING!* **The system is designed to aid in the collection of information and is in no way a substitute for safe operating practice.**

Network Controller Mode

The ***LSI Gateway*** controls a wireless network of up to 32 sensors. The ***LSI Gateway*** wakes and initiates communication with all sensors in its network on start-up. On shut-down the ***LSI Gateway*** instructs all sensors in its network to enter low power sleep mode.

Listen Only

The ***LSI Gateway*** listens to all ***LSI*** GS series sensors within range but does not actually communicate with them. The ***LSI Gateway*** has no direct effect on the network it is listening to.

System sensors need a network controller to avoid entering low power sleep mode. The network controller can be any compatible display or ***LSI Gateway***.

2. INSTALLATION

WARNING! The system must be installed in compliance with *LSI* instructions and using *LSI* supplied components only. Failure to install all parts, or replacing parts or components with parts or components not supplied by *LSI*, may lead to system failure, serious injury or death.

IMPORTANT! Do not power wash the *LSI Gateway*. Power washing the ***LSI Gateway*** voids warranty coverage.

2.1 Line of Sight

Ideally there should be a clear and direct line of sight between each sensor and the ***LSI Gateway*** at all possible positions of any mobile structures on which the system is installed. In ideal conditions the radio range is about 1300 m (over 4000 ft.). Typically each wall or window the signal must pass through reduces the range by half. Metal structures will attenuate the signal; care should be taken not to hide the ***LSI Gateway*** behind metal plates. A clear signal between a sensor and the ***LSI Gateway*** improves communication and increases sensor battery life.

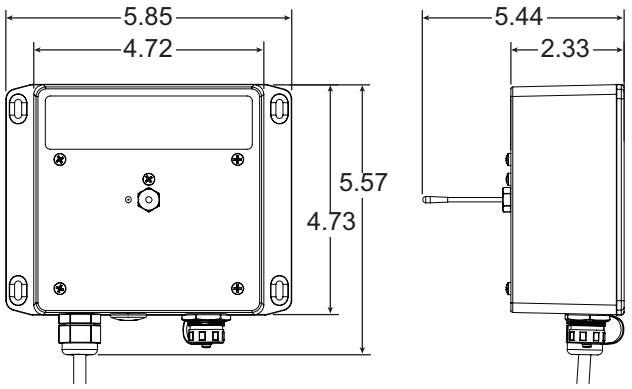

Figure: GS22X-XX LSI Gateway dimensions. Not to scale. Dimensions are in inches.

2.2 Antenna Position

For optimal performance communicating antennas should be parallel to each other without pointing to, or away from, each other at all possible positions of any moving structures on which they are installed. The antenna should have 5 in. of clear space all around it.

2.3 *LSI Gateway* Power Supply

If the USB port is in use, the ***LSI Gateway*** will take its power supply from the USB connector. Otherwise, power should be supplied based on the following wire colors:

2.3a Wiring

Table: Wire description

Wire Color	Description
Red	Power supply, 10 to 30 volts
Black	Ground
Green	CAN-H
White	CAN-L
Blue or Brown	CAN-Ground

2.4 *LSI* WM Configurator

The ***LSI Wireless Gateway*** can be configured using the ***LSI WM Configurator*** software tool on a personal computer (PC) connected to the ***LSI Gateway*** by USB. Furthermore ***LSI WM Configurator*** can be used to make data collected by the ***LSI Gateway*** accessible to data logging applications on a PC connected to the ***LSI Gateway*** by USB or RS232. Initial configuration of the ***LSI Gateway*** may be easier prior to final physical installation depending on accessibility.

2.5 PC Installation

2.5a System Requirements

Windows 2000, XP, Vista (32/64bit) or Windows 7 (32/64bit).

2.5b LSI WM Configurator and USB Driver Installation

Before starting installation, make sure that no *LSI* Gateway is connected to the computer.

1. Download the installation file from ***www.loadsystems.com/wmconfigurator***.
2. Install the file and follow the steps from the installation wizard.

   When transferring the files, the installation wizard will automatically execute the USB driver installation; a Windows warning will recommend to stop the installation, ignore this warning and select ***Continue Anyway*** (***Windows XP***) or ***Install this driver anyway*** (***Windows Vista***, ***Windows 7***).

2.5c LSI Gateway Connection

Windows Vista / Windows 7:

1. Connect the ***LSI* Gateway** to the computer; the device will automatically be installed.

Windows XP:

1. Connect the ***LSI* Gateway** to the computer; ***Found New Hardware Wizard*** will appear.
2. If Windows asks to connect to Windows Update to search for software, select ***No, not this time*** and then click ***Next***.
3. Select ***Install the software automatically***, then click ***Next*** to continue.
4. A Windows warning indicating that the driver has not been tested will recommend to stop the installation, ignore this warning and select ***Continue Anyway***.
5. When the installation wizard has finished installing the software, click ***Finish*** to close the wizard.

When the installation is completed, the ***Device Manager*** will appear as shown below:

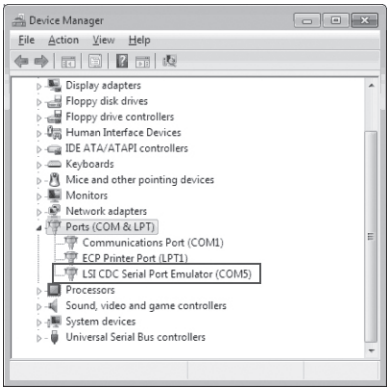

Figure: Device Manager, Windows Vista / Windows 7

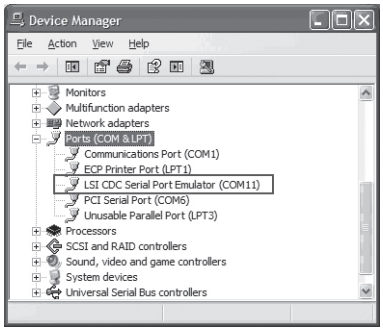

Figure: Device Manager, Windows XP

WARNING! **The system must be installed in compliance with *LSI* instructions and using *LSI* supplied components only. Failure to install all parts, or replacing parts or components with parts or components not supplied by *LSI*, may lead to system failure, serious injury or death.**

3. OPERATION

3.1 Application overview

Access the menus from the treeview (in the upper left) by clicking on it. The appropriated details will be displayed in the right section of the application.

3.1a Datalogger Mode

In this mode, live information sent by the wireless sensors is displayed. The data can be logged to files; see the ***3.1b Settings*** section to configure this feature.

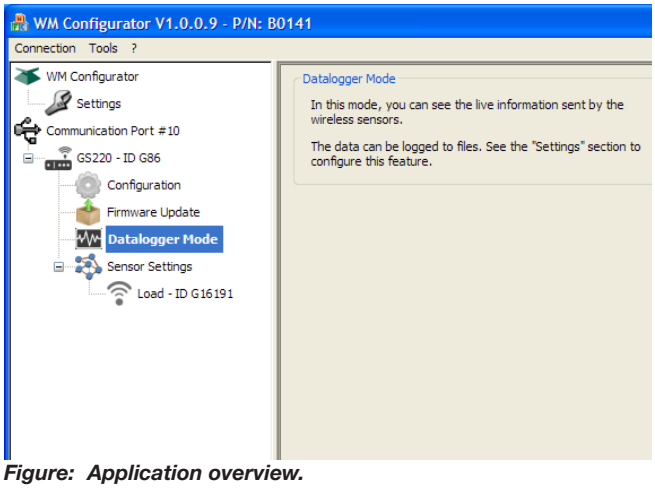
WM Configurator V1.0.0.9 - P/N: B0141
Connection Tools ?
WM Configurator
Settings
Communication Port #10
GS220 - ID G86
Configuration
Firmware Update
Datalogger Mode
Sensor Settings
Load - ID G16191
Datalogger Mode
In this mode, you can see the live information sent by the wireless sensors.
The data can be logged to files. See the "Settings" section to configure this feature.

Figure: Application overview.

3.1b Settings

The data from the datalogger mode can be saved on the computer disk.

1. Define the time interval and location folder of the logs.
2. Press ***Apply*** to save changes or ***Cancel to reload existing setting***.

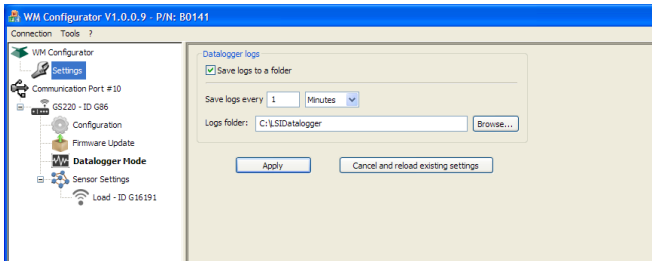

Figure: Settings

3.1c Communication Port

This section displays the communication port in use, the port type and status. The ***Open*** status indicates that the communication port is in use and that the ***LSI Gateway*** is communicating information.

3.1d Configuration

Sensor List:

Sensors in the ***LSI Wireless Gateway*** system are defined in the ***Configuration*** menu and are also displayed under ***Sensor Settings*** in the treeview section. Refer to section ***3.2 Sensor List*** to add, remove or modify sensor information.

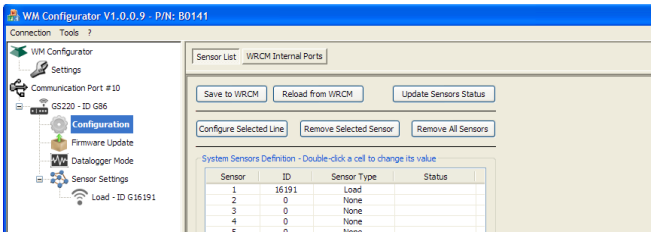

Figure: Sensor List.

LSI Gateway Internal Ports:

The ***LSI Gateway*** internal communication ports behavior can be configured in the ***LSI Gateway Internal Ports*** section.

- **Step 1**: Select the ***LSI Gateway*** internal port to be configured.
- **Step 2**: Set the data logging options of the selected port.

  The data logging options set are compatible with the ***Datalogger Mode*** from the left menu.

  Data Filter: Defines the information sent to the internal communication port;

  All sensors: Surrounding sensors, including the system sensors.

  System Sensors Only: Sensors configured in the ***LSI Gateway***.

- **Step 3**: Set advanced port settings.

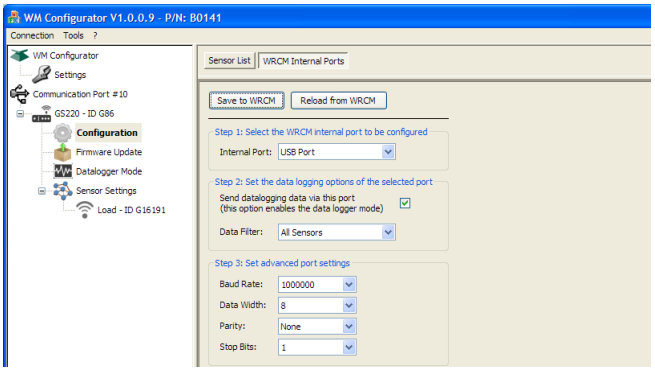

Figure: LSI Gateway Internal Ports.

3.1e Firmware Update

This section displays current ***LSI Gateway*** firmware information and is used to update the firmware. Refer to section ***3.4 Firmware Update***.

3.1f Sensor Settings

When a sensor is selected under Sensor List, the following information is communicated to the ***LSI Gateway***;

- ***Base Station ID***: The radio id number of the ***LSI Gateway*** that has the sensor programmed in its sensor list.
- ***Heart Beat***: When no change is detected in the sensor value, the sensor status will be communicated to the GS22X-XX in the interval indicated (in seconds).
- ***Communication timeout before sleep mode***: When the base station stops communicating information to the sensors, the sensors become inactive (sleep mode). The value indicated is the time (in seconds) before the sensors switch to the sleep mode.
- ***Calibration Offset***: Allows to offset the value configured from the firmware.
- ***Calibration Scale***: Allows to scale the value configured from the firmware.
- ***Tx Sensitivity***: The minimum change in sensor value required to trigger communication.

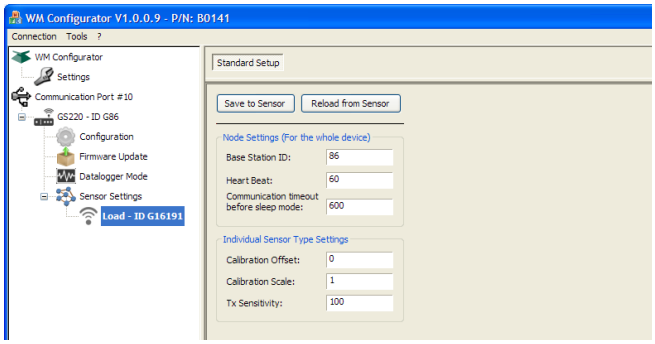

Figure: Sensors standard setup.

3.2 Sensor List

1. In the ***Configuration*** menu, select ***Sensor List***.
2. ***Adding sensors:*** To add sensors to the sensor list;

   Select a line and click on ***Configure selected line*** or double-click on the line.

   Enter the sensor ID and the sensor type .
3. ***Removing sensors:*** *To remove any sensor from the list;*

   Select the sensor line to remove and click on ***Remove selected sensor.***
4. ***Reload from LSI Gateway:*** Reload data from the ***LSI Gateway*** and *display data without saving any changes* (the unsaved data in the ***LSI Gateway*** will be replaced).
5. ***Save to LSI Gateway***: Save changes in the ***LSI Gateway*** memory. ***Save to LSI Gateway*** is automatically followed by ***Update sensor status***.

3.3 Firmware Update (*LSI Gateway* only)

1. Select ***Firmware Update*** in the treeview section.
2. In the right section, click on ***Browse*** to select the update file (extension ***.220***) and then hit ***Update Firmware Now***.

IMPORTANT! **A firmware update will reset the *LSI Gateway* to the factory default configuration.**

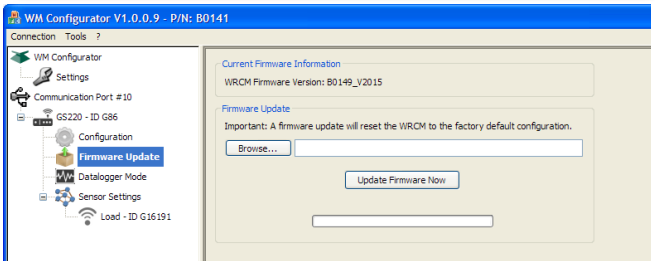

Figure: Firmware update.

3.4 Advanced

3.4a Changing sensors

If a sensor needs to be changed, the ***LSI Gateway*** must learn to recognize the replacement sensor. Two mechanisms are available to change an ID in the sensor list of the ***LSI Gateway***; (1) Automatic ID change, (2) Manual ID change.

3.4b Automatic sensor settings

LSI will supply a replacement sensor programmed to replace the original one. When the replacement sensor is detected by the ***LSI Gateway*** it causes the ***LSI Gateway*** to automatically update the sensor list, replacing the ID of the old sensor with that of the new; the process may take up to two minutes to complete.

3.4c Manual sensor setting

See ***Sensor List***.

4. CERTIFICATION NOTES

4.1 FCC and IC – Instructions to the User

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception.

FCC ID: QVBGS200 IC: 7076A-ICGS200

RF Exposure Warning:

IMPORTANT! **Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

This product complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. To comply with RF exposure requirements, the unit must be installed and operated with 20 cm (8 in.) or more between the product and your body. This product may not be collocated or operated in conjunction with any other antenna or transmitter.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 3.0 dB. Antennas not included in this list or having a gain greater than 3.0 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

Antenna List

LSI P/N:	TA011
Description:	1/4 wave monopole
MFG	Load Systems International

FCC ID: QVBGS000 IC: 7076A-ICGS000
FCC ID: QVBGS001 IC: 7076A-ICGS001
FCC ID: QVBGS050 IC: 7076A-ICGS050
FCC ID: QVBGS075 IC: 7076A-ICGS075

RF Exposure Warning:

This product complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. To comply with RF exposure requirements, the unit must be installed and operated with 20 cm (8 in.) or more between the product and your body. This product may not be collocated or operated in conjunction with any other antenna or transmitter.

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Antenna List

LSI P/N:	TA011
Description:	1/4 wave monopole
MFG	Load Systems International

4.2 CE

4.2a Declaration of conformity

LSI
Load Systems International

LOAD SYSTEMS INTERNATIONAL INC.

Declaration of Conformity
According to EN 45014

Manufacturer's Name: Load Systems International Inc.

Manufacturer's Address:
Canada:
4495 Blvd. Wilfrid-Hamel, Suite 110
Québec, QC, Canada, G1P 2J7

Declare under our own responsibility that the products:

Load sensors: GCXXX-CE, GCXXX-ATEX-CE, GLCXXX-02, GS001-CE, GS001-ATEX-CE; GS002-CE, GS002-ATEX-CE; GS007-XX-CE; GS009-CE

Anti-Two-Block : GS005-CE, GS005-ATEX-CE; GS050-CE; GS050-ATEX-CE; GS075-CE; GS085

Angle sensors : GS010-XX-CE; GS010-XX-ATEX-CE; GS011-XX-CE, GS011-XX-ATEX-CE; GS012-CE, GS030-CE, GS030-10

Wind speed sensors : GS020-CE; GS020-ATEX-CE, GS026

Pressure sensors: PT00120-XXX; PT00130-XXX

Gateways: GS2XX-XX-CE

Displays: GS320-CE; GS375-CE; GS550-XX, GS550-CE; GS550-ATEX-CE; GS550-03-CE; GS550-XX-CE; GS820-CE; GS820-XX-CE

to which this declaration refers conform to the relevant standards or other standardising documents:

Safety: IEC 61010-1: 2nd ed. (2001), EN 61010-1: 2nd ed. (2001)
Wireless: EN 300 220-3 V1.1.1 (2000-09)
EMC: EN 301 489-3 V1.4.1 (2002-08)

Québec, June 21, 2013

Éric Beaulieu
Technologies Manager

4.2b CE Safety

⚠ *WARNING!* **When captors are used, the ambient temperature should not be higher than 84°C and the display should not be used when the ambient temperature is higher than 59°C, otherwise there can be a burn possibility.**

⚠ *WARNING!* **For the operator's safety, take only the ambient temperature range into consideration. The device should be used within this range specified above.**

⚠ *WARNING!* **The protection will be impaired if the material and equipment are used in a manner not specified by the manufacturer.**

⚠ *IMPORTANT!* **The IP of equipment corresponds to 65.**

NOTES

5. LSI PRODUCT LIMITED WARRANTY - APRIL 1ST, 2013

5.1 Limited Warranty

LOAD SYSTEMS INTERNATIONAL INC. (hereafter "LSI") warrants its products (the "Products") will be free from defects in materials and workmanship for a period as determined by the product family as indicated below (the "Warranty Period").

Warranty Length	Product Family
24 months	GC Series Load Cells, GD Series Line Riders, GP Series Load Pins GS001, GS002, GS003, GS004, GS005, GS007, GS010, GS011, GS012, GS020, GS030, GS031, GS035, GS050, GS075, GS101, GS106, GS110, GS112, GS220, GS221, GS222, GS224, GS550, GS820, LP Series Load Pins, LS051, LS055, PT00100
12 months	GS025, GS085, GS320, GS375

Unless otherwise specified, the default Warranty Period for the Products is 12 months after delivery of such product. Please consult LSI for any Product that is not listed in the above chart for further details.
The Warranty Period commences after delivery of such Products to the user (as evidenced on a LSI document) subject to installation and use in accordance with specifications described in the LSI Installer and User's Manual, as amended from time to time, LSI technical materials and any related writings published by LSI with respect with such Products and any applicable industry standards.
During the Warranty Period, LSI or its designated service representative shall repair, or at its option, replace any Product that is confirmed to be defective by LSI, in its sole discretion, in accordance with the Limited Warranty Services Procedures described in this section.

5.2 Warranty Services Procedures

In order to benefit from this Limited Warranty, the purchaser must notify LSI's customer service or LSI's authorized distributor or representative originally responsible for the sale of the Products within 10 days of the occurrence of a suspected defect in materials or workmanship, and in any case prior to the expiry of the Warranty Period. Timely notification will permit the purchaser to obtain a Return Authorization Number which will indicate return procedures and terms and conditions of such returns. A proof of purchase of the Product, such as an invoice or a receipt certifying the validity of the Warranty, must be presented in order to obtain Limited Warranty coverage. In any event, even if a Return Authorization Number is provided to purchaser, LSI reserves the right to inspect the damaged Product or part before its final decision to repair or replace the defective Product or part.
The Product or part shall be returned to LSI or its designated service representative, accompanied by the Return Authorization Number with prepaid shipping charges. The purchaser must insure the shipment or accept the risk of loss or damage during the shipment. Purchaser shall also pay any tariff or duty applicable to the return of the defective part or Product. LSI will, at its option, repair or replace the Product or part returned to LSI or to its designated service representative. LSI owns all parts or Products replaced, repaired or removed from a repaired Product. If LSI repairs a Product, the Product Warranty coverage Period is not extended and the Limited Warranty shall expire as if uninterrupted at the end of the last month of the original Warranty Period from shipping from LSI. If LSI replaces a Product, the replaced Product is warranted for the remainder of the original term or sixty consecutive (60) days, whichever is longer.
LSI reserves the right to require from the user or owner of the Products, prior to determining if the Limited Warranty coverage is applicable, that LSI receive the data logging equipment used with the Products and that LSI be authorized to retrieve all information from such data logging equipment in order to, among others, ensure that the written instructions and applicable standards, including safety margins, were respected and not exceeded during Product use. Failure by the owner or user of the Product to supply such information shall be deemed a material default of the terms and conditions of this Limited Warranty and shall be irrevocably construed as evidence that the Product was misused or abused. Consequently LSI shall irrevocably be relieved of any obligations to compensate the user or owner of the Product for any and all damages resulting from Product failures when data logging equipment, and access to its content, cannot be freely and readily provided, unhampered, to LSI.
LSI will pay ground freight transportation costs of replacement or repaired parts or Products to the destination in the countries in which it maintains a service center (currently Canada, continental United States of America, United Kingdom, Australia and the United Arab Emirates) (the "Territory"). LSI will not pay any transportation costs of replacement or repaired parts to a destination outside of the Territory. Shipping and handling costs to locations outside the Territory shall be the responsibility of and borne by Purchaser or Owner of the Product prior to any shipment by LSI. (Contact LSI to obtain a Return Authorization Number and the address to ship parts).

5.3 Exclusion of Other Warranties

THE ABOVE WARRANTY IS THE SOLE WARRANTY APPLICABLE AND THERE ARE NO EXPRESS, LEGAL OR IMPLIED WARRANTIES OR CONDITIONS IN RELATION TO ANY PRODUCTS INCLUDING

ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE AND THOSE OTHERWISE ARISING BY STATUTE OR OTHERWISE IN LAW OR FROM A COURSE OF DEALING OR USAGE OF TRADE, WHICH ARE EXPRESSLY DISCLAIMED. NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY LSI OR ITS EMPLOYEES OR REPRESENTATIVES SHALL CREATE A WARRANTY OR CONDITION OR IN ANY WAY INCREASE THE SCOPE OF LSI'S OBLIGATIONS. LSI DOES NOT WARRANT THAT THE BUSINESS RESULTS OBTAINED FROM THE USE OF THE PRODUCTS WILL BE APPROPRIATE OR ADEQUATE FOR THE PURCHASER.

5.4 Exclusion

This Limited Warranty does not cover and shall not apply to:
Any Product that is misused or abused, including being altered, modified or repaired not in accordance with LSI written instructions or authorizations or used not in compliance with LSI's instructions and/or industry standards and practices;
Any incidental costs or expense, such as shipping charges to LSI or an designated service representative as well as the technician out-of-pocket expenses including traveling, lodging and meal expenses, if any; The damages caused during the transport or the moving of the Product;Damages caused by accidents, abuse, misuse, a force majeure (described as events outside a LSI's or any Product user's control, including war, riot, strikes, embargoes) or external cause;
Any cost, damage or expenses for field labor or any other expenses related to or arising from the replacement of defective parts.
Products used for pile-driving, wire rope activated clamshell or dragline applications. If purchaser uses the Products for pile-driving, wire rope activated clamshell or dragline application, the Limited Warranty will be deemed to have been violated for abuse.
Any costs associated with providing LSI with data logging equipment.

5.5 Limitation of Liability

To the maximum extent permitted by applicable law, in no event will LSI be liable to the purchaser or any third party for any indirect, special, consequential, incidental or exemplary damages whatsoever, including but not limited to loss of revenue or profit, lost or damaged data, business interruption or any other pecuniary loss whether based on contract, tort or other causes of action, even if LSI has been advised of the possibility of such damages. In any event, the total liability of LSI arising from any cause of action or claim whatsoever, whether (1) in contract, (2) in tort (including negligence, whether sole, joint, contributory, concurrent or otherwise, but not including intentional, reckless or wanton tort), (3) under strict liability, (4) under any environmental or antipollution law or regulation, (5) connected with any toxic or hazardous substance or constituent, (6) arising out of any representation or instruction, or under any warranty, (7) or otherwise, arising out of, connected with, or resulting from the design, manufacture, sale, resale, delivery, repair, replacement or use of Products or the furnishing of any service shall in no event exceed the price allocable to and paid to LSI for the individual unit of Products or service or part thereof which gives rise to the cause of action or claim.
SOME STATES OR JURISDICTIONS DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

5.6 Recommended Practices

LSI recommends careful consideration of the following factors when specifying and installing the Products. Before installing a Product, the Installation, Operation, and Maintenance instructions provided with the unit must be read and understood and complied with.

5.7 Choice of Law

This Limited Warranty shall be governed by and construed in accordance with:
- the laws of the Province of Quebec, Canada for products sold by LSI in Quebec;
- the laws of the Province of Ontario, Canada for products sold by LSI in Ontario and anywhere else in Canada; and
- the laws of the State of New York for products sold by LSI anywhere in the United States of America or anywhere else, excluding Canada.

5.8 Entire Agreement

This document contains the entire agreement of the parties regarding the subject matter of the Product and supersedes all previous communications, representations, understandings and agreements, either oral or written, between you and LSI.

5.9 Vienna Convention Excluded

The United Nations Convention on Contracts for the International Sale of Goods does not apply to this Limited Warranty.

LSI

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LSI technical support is available 24 hours a day, 7 days a week

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